

CHRISTINA RIVER WATERSHED (RED CLAY CREEK) RESTORATION FEASIBILITY STUDY

QUALITY CONTROL (QC) AND INDEPENDENT TECHNICAL REVIEW (ITR) PLAN

1.0 PURPOSE

This Review Plan presents the process that assures quality products for the Christina River Watershed (Red Clay Creek) Restoration Feasibility Study, General Investigation (GI) Feasibility Study. This QC and ITR Plan define the responsibilities and roles of each member on the study and technical review team.

Because the FCSA was signed in February 2005, it was expected that the study would be grandfathered under the implementation guidance for EC1105-2-408 dated 31 May 2005. However, revised guidance received in March 2007 has revised the grandfathering conditions. Therefore, an ITR is now required. This QC and ITR plan will document existing ITR processes and identify future actions to make the study compliant with existing policy.

Under the provisions of new U.S. Army Corps of Engineers (USACE) policy, the ITR will be conducted by specialists from organizations outside of the district responsible for the study. Independent Technical Review will be conducted for all decision documents requiring headquarters approval and will be independent of the technical production of the project.

2.0 APPLICABILITY

This document provides the Quality Control Plan for the Feasibility Study. It identifies quality control processes and independent technical review for all work to be conducted under this study authority, including in-house, sponsor and contract work.

3.0 REFERENCES

EC1105-2-408 "Peer Review of Decision Documents" dated May 31, 2005
ER 1105-2-100 "Planning Guidance Notebook & Appendices"

4.0 GENERAL PROJECT DESCRIPTION

The Christina River watershed is located in New Castle County in Delaware; Delaware, Chester and Lancaster Counties in Pennsylvania; and Cecil County in Maryland. The watershed drains an approximate area of 565 square miles.

The Christina River Watershed has been heavily urbanized since the mid-19th century and many wetland areas were filled in for industrial purposes. A Reconnaissance Study was completed in August 2002. The study identified impaired areas of the watershed and recommended potential solutions for each, including but not limited to ecosystem restoration, fish & wildlife habitat restoration, and flood damage reduction. Based on this study, opportunities within the Christina

River Watershed (in Delaware and Pennsylvania) include reducing flood damage, improving aquatic habitat, providing public access to streams and dedicated greenway corridors, acquiring critical lands, and improving water quality. Various solutions to address these problems for specific locations within the watershed will be considered in depth during the feasibility phase, such as riparian buffer enhancement, stream bank stabilization, natural stream channel restoration, construction of fish passages, wetland creation and restoration, and structural flood damage reduction measures. The Feasibility Cost Sharing Agreement (FCSA) has been signed by the non-Federal sponsor for Delaware.

The Reconnaissance Report was completed in FY02. FY03-FY05 funding was used to develop a plan of study and FCSA for a smaller study within the Christina Watershed involving Red Clay Creek in Delaware. The feasibility cost sharing agreement was executed in February 2005.

5.0 REVIEW REQUIREMENTS

Initial Quality Control (QC) review will be handled within the Section or Branch performing the work or by staff in the corresponding Sponsor Department when it involves In-Kind Services. Additional QC will be performed by the PDT during the course of completing the integrated Feasibility Study. The detailed checks of computations and methodology should be performed at the District level, and the processes for this level of review are well established.

Pursuant to EC 1105-2-408, item 2 c (2), Models used in the preparation of decision documents covered by this Circular will be reviewed in accordance with EC 1105-2-407, Planning Models Improvement Program: Model Certification, and are not subject to the requirements of this Circular. The uses and applications of models in individual studies that lead to the preparation of decision documents covered by this Circular will be reviewed in accordance with the requirements of this Circular.

Pursuant to EC 1105-2-408, the integrated Feasibility Report will need an ITR team assigned by the PCX for Environmental Restoration (National Ecosystem Planning) Projects. It is recommended that the ITR be handled entirely within USACE, as the scope and technical complexity do not warrant an External Peer Review (EPR), based upon the initial Risk Screening Process conducted by the Project Development Team (PDT) noted in Section 9. It is anticipated that while this study will be challenging and beneficial, it will not be novel, controversial or precedent setting, nor have significant national importance. As a result, the ITR will focus on:

- Review of the planning process and criteria applied.
- Review of the methods of preliminary analysis and design.
- Compliance with USACE authority and NEPA requirements.
- Completeness of preliminary design and support documents.
- Spot checks for interdisciplinary coordination.

6.0 REVIEW PROCESS

It is anticipated that the ITR Team Review Process will begin after the ITR Team has been assigned, and will cover the feasibility study and associated products developed to date.

Coordination is ongoing to define the PCX. As alternative plans are formulated, the Review Process will focus on data, assumptions and the engineering, scientific, economic, social & environmental analysis process. Major Review Process milestones are listed below:

- Approval of Review Plan by NAD
- ITR team assigned by PCX
- P-8 Milestone – AFB RAM
- AFB
- Draft Report Review
- Final Report Review

7.0 REVIEW COST

It is anticipated that documents to be reviewed will be transmitted electronically. Comments will be made and addressed in Dr. Checks, a computer program used to aggregate comments. It is also expected that the ITR team for the PCX will be working virtually. The ITR team, or a representative of that team, may be required to physically attend significant milestone meetings. The team should participate in all P milestone meetings; however, via conference call or video tele-conference.

8.0 REVIEW SCHEDULE

Note that since the commencement of this study preceded the requirement for PCX involvement and development of this Review Plan, the review schedule below does not match the major review process milestone list above.

TASK	START DATE	FINISH DATE
Develop ITR Plan & post to Web Site, PCX	TBD	
Identify Regional ITR resources & Recommend ITR Plan to PCX		
PCX Approves or Assigns ITR Team		
Review of Draft Feasibility Report		
Review Final Feasibility Report	Based on HQ comments and Public review	

9.0 PROJECT RISK

The PDT members were asked to rate their assessment of the risk associated with this project based upon several factors and rate the project quantitatively among the defined levels of project risk of failure ranging from low to high. Based upon this analysis by the PDT, the project is projected to be low to medium in risk. The PDT considered previous District project experience when making this analysis. No attempt was made to tie this to a national scale of rating, so it is likely that the risk level would have been lower if the team were to have compared the risk of this project to a large ecosystem restoration project. The Project Delivery Team (PDT) scored each item in the QCP Score Guide (Table 9.1) to get an average score. The Project schedule and cost were assessed as a low degree of risk if they both remained flexible and a high degree of risk if the Project schedule and cost was fixed. Staff Technical Experience was assessed as a low

degree of risk if the staff had a high level of ecosystem restoration experience and a high degree of risk if the staff had a low level of ecosystem restoration experience. The score for the risk items were summed and the average value of the Assessment Score was used to determine the overall level of project risk. The results of the evaluation are tabulated as follows:

Table 9.1 Quality Control/Review Plan Score Guide

Project Risk Item	Assessment Score (Low Degree to High Degree)					Score
	Low		Medium		High	
Potential for Failure	1	2	3	4	5	2
Uncertainties of Predictions	1	2	3	4	5	3
Long Term Cumulative Effects/Customer Expectations	1	2	3	4	5	4
Staff Technical Experience	1	2	3	4	5	3
Failure Impact and Consequences	1	2	3	4	5	2
Average Project Risk Assessment Score						2.8
Project Magnitude Item						
Product Schedule/Cost	1	2	3	4	5	3
Project Complexity	1	2	3	4	5	3
Project Benefits	1	2	3	4	5	3
Project Scale	1	2	3	4	5	3
Average Project Magnitude Assessment Score						3.0

10.0 REVIEW PLAN

The components of the Review Plan (external ITR only) were developed pursuant to the requirements of EC1105-2-408.

10.1 Team Information

The decision documents that will be the ultimate focus of the peer review process are the integrated Feasibility Report, the Division Commander's Public Notice, and the Environmental Record of Decision (ROD). The purpose of the decision documents will be to begin the approval process leading to the authorization to begin Plans & Specifications.

The PDT is listed as follows.

District PDT Members:

Project Manager
Environmental Specialist
GIS Specialist
Economist

Hydraulic Engineer
Civil/Structural Engineer
Geologist
Real Estate Specialist

Non-District PDT Members:

Delaware Department of Natural Resources
& Environmental Control
New Castle County

Independent Technical Review Team:

Planning
Economics
Environmental
Real Estate
Engineering:

- Hydraulics & Hydrology
- Civil Structural
- Geotechnical

10.2 Scientific Information

Based upon the self-evaluation by the PDT, it is unlikely that the USACE report to be disseminated will contain influential scientific information. The environmental restoration measures will be identified using standard engineering and economic methods. It is unlikely that this study will create new and untested methods or unique scientific information; however, it will benefit from ongoing research by others and from practical lessons learned during the course of the restoration program.

Economic and planning processes will additionally consider the Collaborative Planning EC. This EC describes all the economic accounts that can be used to describe economic benefits. The four main economic accounts are national economic development (NED), national ecosystem restoration (NER), regional economic development (RED), and the other social effects (OSE).

10.3 Timing

The ITR process is envisioned to begin with an assessment of the evaluation and comparison of alternative plans in this feasibility study.

10.4 External Peer Review Process

No External Peer Review process is envisioned at this time. This assessment is supported by the evaluation of the PDT and tabulated as shown in Section 9 of this QCP.

10.5 Public Comment

Public involvement is anticipated throughout the Feasibility Study. The Public Involvement meeting dates have not been scheduled at this time. An initial Public Forum was held in April 2007.

It is anticipated that minutes of Public Involvement Meetings will be disseminated to the Peer Review Team. This will allow the public response to be available to the ITR team for their review.

10.6 ITR Reviewers

It is anticipated that reviewers should be available in the following disciplines:

Planning, Economics, Environmental, Real Estate, Engineering. The reviewer contact information should be stated in Section 10.1 of this QCP.

The expertise that should be brought to the review team includes the following:

- 1) Planning – The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on “lessons learned” in advising the PDT of best practices.
- 2) Economics – The reviewer should have a solid understanding of economic models including SID, EAD, and incremental cost analysis, as well as cost/benefit analysis.
- 3) Environmental – The reviewer should have a solid background in natural stream restoration techniques, and related methods for flood damage reduction.
- 4) Real Estate - the reviewer should have a solid background in real estate requirements and the use of easements for environmental restoration.
- 5) Engineering - The reviewer should be familiar with low tech design techniques and ecological methods used for stream restoration, as well as structural and non-structural measures that may be needed for flood damage reduction.

10.7 External Peer Review Selection

Because an External Peer Review is not anticipated for this study, there is no EPR selection.